WEST COAST GROUNDFISH OBSERVER PROGRAM
DATA REPORT AND SUMMARY ANALYSES OF NON-SABLEFISH-ENDORSED LIMITED ENTRY FIXED-GEAR PERMITS

Northwest Fisheries Science Center

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Introduction

Objective

The WCGOP collects at-sea data from limited entry trawl, nearshore, prawn, and shrimp fleets. The WCGOP's goal is to collect information on the discard of west coast groundfish to be used in assessing and managing the total fishing mortality of a variety of groundfish species. This report summarizes data collected by the West Coast Groundfish Observer Program (WCGOP) from the limited entry fixed-gear non-sablefish-endorsed fishery from August 2002 thru September 2004.

The West Coast Fixed Gear Fishery

Vessels using fixed gear catch a variety of species, including thornyheads, sablefish, rockfish, and flatfish, along the entire west coast of the United States. Many of these vessels are part of the limited-entry groundfish fleet, some with a sablefish endorsement, while others fish under the open-access provisions of the fishery management plan. Most limited-entry fixed-gear vessels fish in deeper waters. The limited entry fixed gear fishery uses longline and/or fish pots. The fleet typically fishes in depths greater than 80 fathoms, and may be restricted to even greater depths under evolving management of the fishery. Nearly all of the vessels participating in this fishery deliver their iced catch to shoreside processors.

A portion of their catch is retained, but some is discarded at sea. Reasons for at-sea discard include unmarketability and attainment of vessel landing limits. Also, since the price paid by processors for sablefish is dependent on fish size, small fish may sometimes be discarded, as fishermen seek to maximize the value of their landed catch allowances.

Unlike most rockfish, sablefish do not have swim bladders that expand or explode when the fish are retrieved rapidly from great depth. Consequently, if handled properly, discarded sablefish can experience high rates of survival (Olla, et al., 1998).

Non-sablefish-endorsed vs. sablefish endorsed permits

There are approximately 225 permits limited-entry fixed-gear permits (NMFS, NWR, Fisheries Permits Office http://161.55.16.25/main/nwp_system_version3/login/logoff_logon_form.cfm). Approximately sixty of these permits are not sablefish endorsed. These permits are subject to daily and weekly trip limits for sablefish. During 2004, daily landing limits ranged from 300 –350 lbs. depending on the area fished. There was also a weekly option that provided the opportunity to make a single delivery during a week, up to a poundage threshold that ranged between 900 and 1,050 pounds. Landings made under either of these options are also capped by a 2-month limit of 3,600 pounds. The limited entry fixed gear non-sablefish-endorsed fishery operates throughout the year.

The other permits have a sablefish-endorsement, which provides the permit holder with an annual share of the sablefish fishery. From April to October, vessels with sablefish endorsed permits participate in the sablefish fishery until they reach their tier limits. . Outside of the primary season, or following the attainment of their tier limits, sablefish-endorsed permits may also land sablefish under the provisions of the daily/weekly limit.

Fish tickets and logbooks

Fisheries managers and enforcement officers use state-issued sales receipts (fish tickets) to monitor landings. This information is transferred to the Pacific Fisheries Information Network (PacFIN) by state fisheries agencies in Washington, Oregon, and California. Fish tickets are used to ensure that each vessel's landings during the primary fishery do not exceed the sum of the vessel's tier limits. Unlike the groundfish trawl fleet, vessel fishing logbooks are neither required nor routinely collected for the fixed-gear fleet. This absence prevents an analysis comparing observed and unobserved fishing locations. Further, while trawl observers are able to record a vessel's haul-by-haul logbook

estimates of retained catch, fixed-gear observers can only rely on their own set-by-set estimates of discarded and retained catch (see Methods).

West Coast Groundfish Observer Program

On May 24, 2001, NOAA Fisheries (NMFS) established the WCGOP to implement the Pacific Coast Groundfish Fishery Management Plan (50 CFR Part 660). This regulation requires all vessels that participate in the groundfish fishery to carry an observer when notified to do so by NMFS or its designated agent. The observer program's goal is to improve estimates of total catch and discard. The program deploys as many as 40 observers, depending on seasonal variation in fishing activity. These observers are stationed along the coast from Bellingham, WA to San Diego, CA.

Program Goals

During the first year of coverage, the primary goal for the WCGOP was to provide observation of 10% of the coast wide limited entry trawl landings of groundfish species other than whiting (as reported in fish tickets). However, an additional goal was to provide pilot observer coverage in the limited-entry fixed-gear sablefish fishery (The observer coverage plan is available at: http://www.nwfsc.noaa.gov/research/divisions/fram/Observer/). During the second year of coverage, the program's goal was to increase trawl coverage and expand coverage of the limited-entry fixed-gear sablefish fishery, nearshore, prawn, and shrimp fisheries.

While a major focus of the WCGOP continues to be the limited entry trawl fleet, the program has accomplished its goal of expanding coverage for the limited-entry fixed-gear fleet, the nearshore, prawn, and shrimp fleets. This report summarizes data from only the limited-entry fixed gear non-sablefish-endorsed fishery.

Methods

Permit Selection Process for Non-Sablefish-endorsed Limited-entry Permits

Assignment of permits to port groups

The first step in the stratified random selection of permits is to associate each permit with one of the port groups defined by the program. Fixed-gear permits are assigned to a port group based upon the location of the previous year's landings. The use of port groups is designed to produce a distribution of observations along the coast that is proportional to the volume of landings. Within each port group, permits are placed in a randomly selected order and sequentially selected for observation. Initially, all fixed gear permits were pooled for selection. Starting in 2003, the non-sablefish-endorsed permits were selected separately from the sablefish-endorsed permits for observation over a two-month period.

Fixed Gear Data Collection

The fisheries observers are trained professionals who monitor and record catch data on commercial fishing vessels, following the protocols in the WCGOP Manual (NMFS, NWFSC, 2004, unpublished report). The data collected by the observers include:

- Start time, end time, and location of the set
- Gear type and fishing strategy
- Estimated total catch weight (including sets for which there is 100% discard)
- Weight of discard by catch category
- Reason for discard by catch category or species
- Species composition of discard by catch category
- Weight of fish retained by catch category
- Species composition of retained by catch category
- Document catch of prohibited species and incidental take of protected species
- Size composition, tags, and viability assessments for Pacific halibut
- Size composition of discarded fish (from randomly selected categories)
- Size composition of retained fish (from randomly selected categories)
- Basic taxonomic composition of non-fish bycatch

• Special biological collections (otoliths, maturity, food habits, genetic samples, etc.)

Fishing Trip Data

Fish ticket identification numbers are obtained from captains, processing plants, or PSMFC-WCGOP state liaisons and recorded. Observers interview skippers in order to assign a target strategy and gear code to each set.

Observed Total Catch

The methods used to estimate the observed total catch (OTC) of a set are: 1) summation of observed retained and discarded fish, and 2) extrapolation of partial observations. Use of method 1 is preferred. However, observers follow these general rules when deciding which method to employ:

1. If all individual fish in a set are counted, the estimated total catch weight is derived by multiplying the number of retained and discarded fish by the appropriate catch category weights from the Catch Form.
2. If all of individual fish in a set are not counted, extrapolation is used. The weights of retained and discarded species in the sample are derived as above, then divided by the number of hooks sampled, and multiplied by the total number of hooks in the set.

OTC's are calculated using the number of hooks or pots set. This accounts for potential fishing mortality from lost gear..

Composition Sampling

Observers sample both retained and discarded catch on fixed gear vessels by tally sampling. Tally sampling means that the observer counts every individual fish that is caught, by species, including fish released from longlines before they are brought onboard, for all hooks or pots in a set, or a randomly selected sample thereof. Total hooks or pots in a set are determined by:

1. Counting all hooks or pots in the set,

2. Multiplying the average number of hooks per skate by the number of skates in a set. When this method is used, observers count hooks on at least 1/5 of the gear fished during each trip.

Catch Category Sampling

Catch categories are assigned, based on species disposition (retained or discarded) and the method employed for determining fish weight. Three methods of determining fish weight are used on fixed gear vessels:

1. Tally Sample – This method is used if all species are counted and an actual or extrapolated weight is obtained.
2. Visual Estimate – This method is used if a species is counted, but an actual or extrapolated weight is not obtained. It is commonly employed for large species that cannot be weighed, such as big skates. This method is also used when obtaining individual weights could increase release mortality.
3. Pacific halibut length-weight estimate – This method is used for Pacific halibut only. An estimated or actual length is taken and the Length/Weight conversion table generated by the International Pacific Halibut Commission is used to determine weight.

If visual estimates or Pacific halibut length/weights are used, the actual number of fish in the tally sample must be documented for the catch category.

Species Composition Sampling

Species Composition samples are taken for all retained and discarded catch categories using the tally sample weight method. Actual counts, from the tally sample, are used. Weights can be actual (all individuals of species are weighed) or extrapolated from average weight.

Reasons for Discard

Observers document the reason for discard based on reason provided by the captain or crew for each catch category and/or species. The reasons for discard are categorized as 'prohibited', 'size', 'market', 'regulation', 'other', 'drop-off', and 'predation'.

When discerning a reason for discard for a species, the primary reason for discard is used. Therefore, the categorizations of 'drop-off' and 'predation' are only used for fish that would have been retained.

Data Management

The WCGOP uses the following procedure to ensure that the quality of the data collected is maintained. Data are collected at-sea by the observer following the protocols in the WCGOP Manual (NMFS, NWFSC, 2004, unpublished report). During 2004, WCGOP used a web-based graphical user interface (GUI) that allows observers to directly enter data into a centralized Oracle database located at the Northwest Fisheries Science Center (NWFSC). Data within the Oracle database are accessible via the web-based GUI or by direct SQL queries to the database. For a list of data tables, see appendix A. For quality control of calculations and sampling methods, a debriefer or lead observer checks all computations made by the observer and reviews form to ensure that it is complete and that appropriate sampling methods were used. The observers are also debriefed after every two-month cumulative trip limit period. Observer debriefing includes a vessel survey, a review of observer logbooks, data correction, and observer evaluation. The database is then corrected after debriefing. For quality control, the electronic data is compared to the raw data forms, and queries are run to detect data that fall outside specified ranges and other inconsistencies between data elements. The data issues detected by the QC queries are then reviewed and the electronic data is updated. Finally, the data are considered complete and ready for analysis.

Results and Discussion

Observed and unobserved landed catch (in metric tons) landed by the limited entry non-sablefish-endorsed fixed gear fishery is listed in Table 1. Permits were randomly selected within each port group. In 2002, non-sablefish-endorsed permits were pooled with sablefish endorsed permits. In 2003, non-sablefish endorsed permits were selected separately from sablefish endorsed permits. Vessels using pot and longline gear were pooled together for selection. Very few vessels (<1%) used pot gear during the first year. During the second year, the use of pot gear increased to twelve percent. This increase can likely be attributed to vessels using fish pots in the sablefish fishery that had reached their tier limit.

The number of sablefish tier-limit trips and sets observed are summarized in Tables 2 and 3, respectively. Table 2 reports the distribution of coast wide observed trips among port groups. Please note that the port-group assignment in Table 2 represents the port in which the fish were off-loaded from the vessel, not necessarily the port at which the fish were processed. Port-group assignments in Table 1 reflect ports as recorded on fish tickets. Sometimes fish are trucked to a different port following off-loading, which can result in apparent discrepancies between Tables 1 and 2 . Table 3 summarizes the number of sets that were observed by general area depth strata. The vast majority of observed sets are occurred in the deep strata. The dividing depth between deep and shallow used in this table was 100 fathoms for sets made north of $40^{o}10'$ N. lat., 150 fathoms for the observed sets made south of $40^{o}10'$ N. lat.

It is important to note that WCGOP controls only the selection of permits for coverage. The activity of the selected vessels can vary in unpredictable ways. Therefore, the program cannot control the percent of tonnage or trips that are observed. Also, the current sampling protocol does not separate longline from pot permits. As a result, coverage levels within each gear type, particularly within a port group, may vary from one year to the next, depending on which permits are selected. In the future, as patterns in vessel activity emerge, the coverage levels can be more easily controlled.

Pounds observed and rates of discard for 22 species or species groups encountered on observed sets are summarized in Table 4. For each species, the decision to discard is dependent not only upon levels of corresponding landing limits, but also the size, condition, and marketability of the fish. For many marketable species, such as lingcod, thornyheads, and slope rockfish, retention rates are generally high. In other cases, such as yelloweye rockfish, retention has not been allowed, in order to prevent targeting. In the case of Pacific halibut, only vessels with halibut licenses fishing within the designated halibut season may retain halibut.

Bycatch ratios for overfished species caught on observed sets in deep water are summarized in Table 5, by gear, year, and area. Bycatch ratios were not calculated for shallow strata because there were only eight sets observed in shallow water (<100fm north of $40^{o}10'$N and < 150FM south of $40^{o}10'$N). The bycatch ratios are calculated by dividing the total poundage caught of each species by the amount of retained sablefish, thornyheads, other roundfish, and other slope rockfish per of 100 lbs.

No canary rockfish, cowcod rockfish, widow rockfish, or Pacific ocean perch were caught in observed sets. Bocaccio rockfish (5 pounds) caught in only one observed set the south at shallow depths during year two. Yelloweye was discarded in only one observed set in the north in deep water (Figure 1). Darkblotched rockfish was discarded in only two sets north in deep water (Figure 1). . Most sets have small or no amount of discarded of lingcod (Figure 2).

References

Olla, B.L., M.W. Davis, and C.B. Schreck, "Temperature magnified postcapture mortality in adult sablefish after simulated trawling," *Journal of Fish Biology* (1998) **53**, 743-751.

Appendix A. Oracle Database

Database Table Hierarchy

TRIPS

► FISHING_ACTIVITIES

► FISHING_LOCATIONS

► CATCHES

► SPECIES COMPOSITION

► SPECIES_COMPOSITION_ITEMS

►BIO_SPECIMENS

► BIO_SPECIMEN_ITEMS

► DISSECTIONS

Database Table Descriptions

The database tables listed in the table below are a subset of the total tables contained in the Oracle database. They represent the tables that are actually used to contain the observer data collected by the WCGOP.

BIO_SPECIMENS	Sets of species physical measurements resulting from sampling catches occurring in a haul or set
BIO_SPECIMEN_ITEMS	Physical measurements collected for an individual fish, mammal or bird occurring in a biological sample
CATCHES	PacFIN catch category based on estimates of fish caught during a haul or set
CATCH_CATEGORIES	PacFIN catch categories
DISSECTIONS	Physical specimens collected for an individual fish, mammal or bird
FISHING_ACTIVITIES	Fishing hauls or sets occurring during a trip
FISHING_LOCATIONS	Locations of hauls or sets
PORTS	Coastal cities where fishing activity is based out of
SPECIES	Fish, mammal and bird species that might be encountered during fishing
SPECIES_COMPOSITIONS	Sets of species weights and counts resulting from sampling catches occurring in a haul or set
SPECIES_COMPOSITIONS_ITEMS	Weights and counts for individual species occurring in a species composition sample
TRIPS	Sets of fishing activities that occur between the time a vessel leaves port and when it returns
VESSELS	Trawl, longline, pot or other fishing vessels